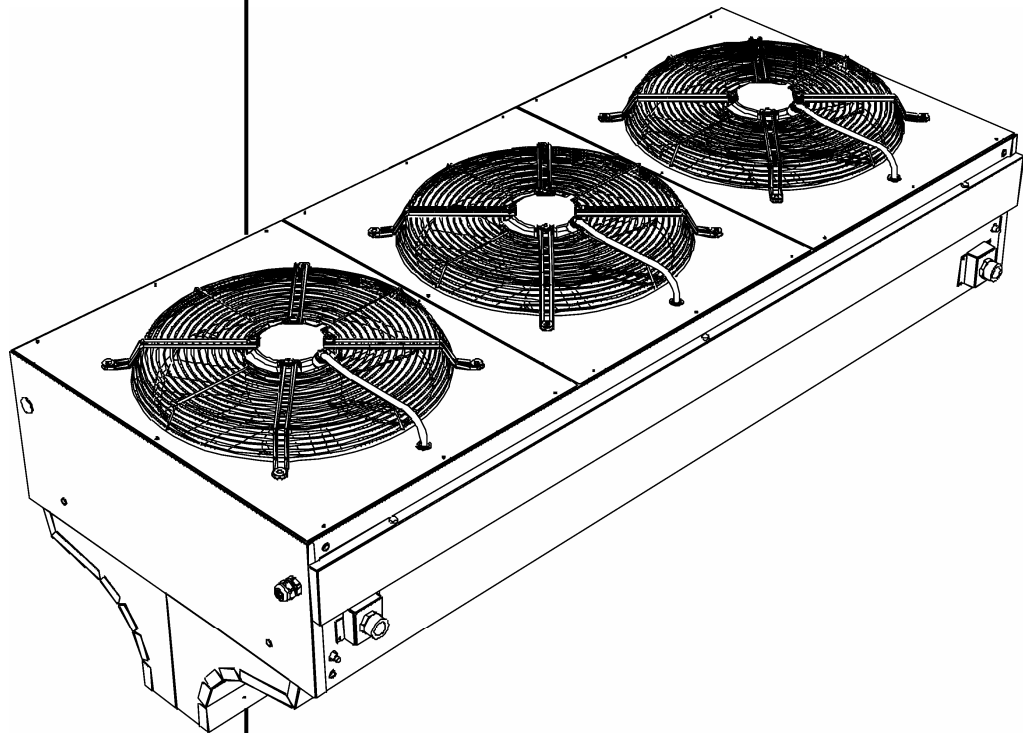




**biddle**

CLIMATE SOLUTIONS



# Manual

Industrial Air Curtain  
Model **IF**

Version 1.1

27-06-2007

English

CE

## Copyright

All the information and drawings in this manual are the property of Biddle and may not be used (other than for the actual operation of the device), photocopied, duplicated, translated and/or be brought to the attention of third parties without Biddle's prior written permission.

The name Biddle is a registered trademark.

## Trademarks

The name Biddle is a registered trademark of Biddle bv.

## Warranty (guarantee) and liability

Please refer to Biddle's Terms of Sales and Delivery for warranty (guarantee) and liability conditions.

Biddle excludes liability for consequential loss at all times and under all circumstances.

## Liability for the contents of this manual

However much care might have been taken in ensuring the correctness and, where necessary, completeness of the description of the relevant parts, Biddle disclaims all liability for damage resulting from any inaccuracies and/or deficiencies in this manual.

Should you detect any errors or ambiguities in this manual then we would be pleased to hear from you: it helps us to improve our documentation even further.

Biddle retains the right to change the specifications stated in this manual.

## For more information

If you have any comments or questions about specific topics relating to this product, please do not hesitate to contact Biddle.

## Addresses

### Canada

Biddle Air Systems Ltd.

11 King St.

Unit # 3

Barrie, ON L4N 6B5

telephone: 705 797 0007

fax: 705 797 0013

toll free: 866 693 4333

e-mail: [biddle@biddle.ca](mailto:biddle@biddle.ca)

internet: [www.biddle.ca](http://www.biddle.ca)

### Other countries

Biddle Export

PO Box 15

NL-9288 ZG Kootstertille

The Netherlands

telephone: +31 512 335555

fax: +31 512 335554

e-mail: [export@biddle.nl](mailto:export@biddle.nl)

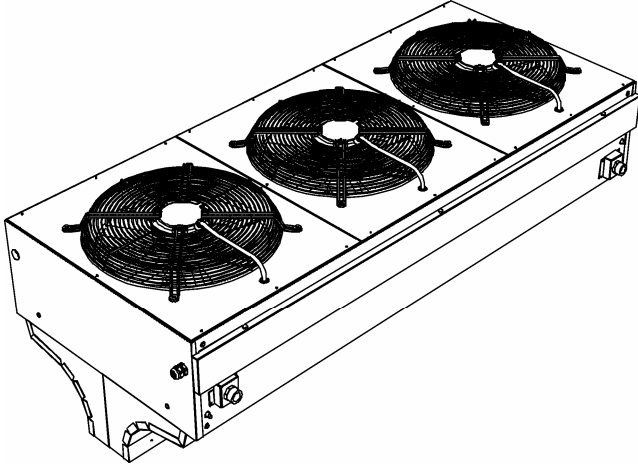
internet: [www.biddle.info](http://www.biddle.info)

# Contents

<b>1 Introduction</b> .....	<b>4</b>	<b>2.4.1</b> Method of suspension.....	<b>8</b>
<b>1.1</b> About this manual .....	4	<b>2.4.2</b> Positioning .....	9
<b>1.2</b> How to use this manual .....	4	<b>2.4.3</b> Mounting the units .....	9
<b>1.2.1</b> Marginal symbols in the manual .....	4	<b>2.5</b> Installing units vertically .....	10
<b>1.2.2</b> Pictograms used on the unit and in the manual .....	4	<b>2.5.1</b> Method of installation.....	10
<b>1.2.3</b> Related documentation.....	4	<b>2.5.2</b> Positioning .....	10
<b>1.3</b> About the unit.....	5	<b>2.5.3</b> Installing the units .....	10
<b>1.3.1</b> Applications .....	5	<b>2.6</b> Connecting units to the CH system	12
<b>1.3.2</b> Principle of operation .....	5	<b>2.6.1</b> General .....	12
<b>1.3.3</b> Type designation, unit.....	5	<b>2.6.2</b> Connecting water pipes .....	12
<b>1.3.4</b> Type plate .....	5	<b>2.7</b> Connecting the fans.....	12
<b>1.4</b> Parts .....	6	<b>2.7.1</b> General .....	12
<b>1.4.1</b> Parts supplied with the unit.....	6	<b>2.7.2</b> Making connections within the units .	12
<b>1.4.2</b> Accessories .....	6	<b>2.8</b> Switching on and checking operation.....	13
<b>1.4.3</b> Parts not supplied .....	6	<b>3</b> Maintenance .....	14
<b>1.5</b> Safety instructions .....	6	<b>3.1</b> Safety instructions .....	14
<b>1.5.1</b> Operation.....	6	<b>3.2</b> Cleaning.....	14
<b>1.5.2</b> Installation, maintenance and service .....	7	<b>3.3</b> Scheduled maintenance .....	14
<b>2</b> Installation.....	<b>8</b>	<b>3.3.1</b> Monthly maintenance .....	14
<b>2.1</b> Safety instructions .....	8	<b>3.3.2</b> Annual maintenance .....	14
<b>2.2</b> Delivery check .....	8	<b>4</b> Solving problems .....	<b>15</b>
<b>2.3</b> General instructions.....	8	<b>4.1.1</b> General.....	15
<b>2.4</b> Suspending units horizontally.....	8	<b>4.1.2</b> Unit does not discharge any air .....	15
		<b>4.1.3</b> Unit discharges little air.....	15
		<b>4.1.4</b> Unit does not heat, or too little .....	15

# 1 Introduction

## 1.1 About this manual



This manual describes the installation and maintenance of the Industrial Air Curtain, model IF.

## 1.2 How to use this manual

### 1.2.1 Marginal symbols in the manual



**Note:**

Draws your attention to an important part of the text.



**Caution:**

If you do not carry out this procedure or action correctly, you may damage the unit.

So, follow the instructions carefully.



**Warning:**

If you do not carry out this procedure or action correctly, you may cause material damage and/or physical injury.

So, follow the instructions carefully.



**Danger:**

This indicates actions which are not permitted. Ignoring this warning may lead to serious damage or accidents that may involve physical injury.

**For units with ...:**

The description applies only to models that have the feature referred to.

If no specific model is referred to, the description applies to all models.

### 1.2.2 Pictograms used on the unit and in the manual

The below pictograms refer to possible risks or dangers. These pictograms can also be found on the unit.

	<p><b>Warning:</b> You are entering an area which contains live components.  Accessible to qualified maintenance staff only. Caution is urged.</p>
	<p><b>Warning:</b> This surface or part can be hot. There is a risk of burns on contact.</p>

### 1.2.3 Related documentation

In addition to this manual, the following document is supplied with the unit:

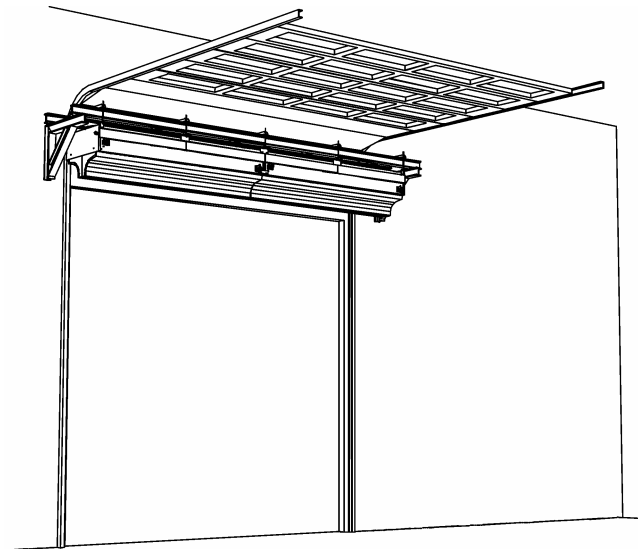
- wiring diagram for installation and service purposes.

## 1.3 About the unit

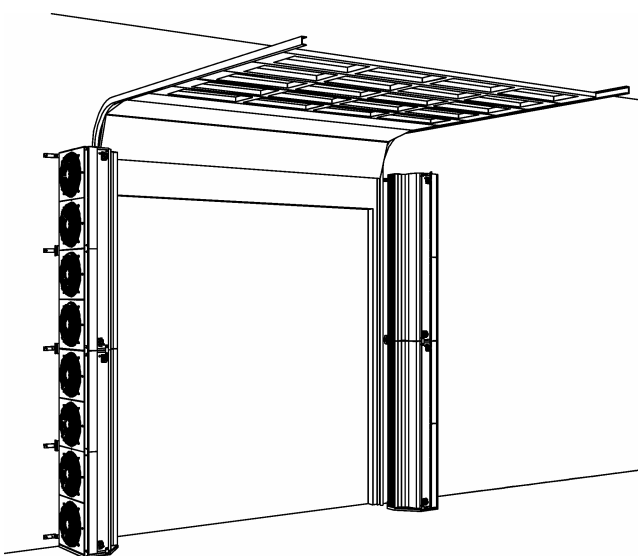
### 1.3.1 Applications

The air curtain model **IF** is designed to separate the indoor and outdoor climates or the climates in two rooms. It is installed above or next to the door, across the full width or length of the doorway. The **IF** model is particularly suitable for larger doors in industrial buildings.

The air curtain is either hung horizontally above the doorway or installed vertically next to the doorway (to the left or right or on both sides).



Example of a horizontal installation



Example of a vertical installation

### 1.3.2 Principle of operation

The air curtain draws air from the room and blows it, either heated or not, as a directional air stream across the doorway.

The air curtain reduces the undesired effects of an open door by either reducing the exchange of air between two rooms or heating the entering air, or by combining these two features.

### 1.3.3 Type designation, unit

The type designations, when combined, constitute the type code for the relevant unit, for instance:

**IF 2-W1**  
**IF 3-W2**  
**IF 4-A**

Every combination can be supplied.

*Explanation of type code of unit*

series	<b>IF</b>	<i>InduForce</i> industrial air curtain
unit size	<b>2, 3, 4</b>	number of fans
heating	<b>W1, W2, W3</b>	hot water
	<b>A</b>	without heating (Ambient)

### 1.3.4 Type plate

You will find the type plate on the heating section of the unit.

 Biddle bv Markweij 4 NL-9288 HA Kootstertille  	Type	IF 3-W1		
	Code		U 400 V 3N- 50/60 Hz	
	N°	203040/1-10 07-26	I <sub>max</sub> L1	1,8 / 2,22 A
			I <sub>max</sub> L2	1,8 / 2,22 A
	M	105 kg	I <sub>max</sub> L3	1,8 / 2,22 A
	Medium	LPHW	P <sub>motor</sub>	0,99 / 1,38 kW
	p <sub>max</sub>	800 kPa / 175 °C	P <sub>heating</sub>	-

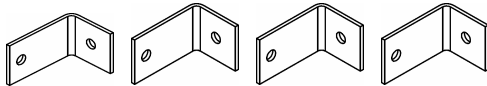
Example of a type plate

## References on the type plate

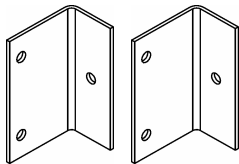
<b>Type</b>	full type code of unit
<b>M</b>	weight of unit
<b>P<sub>max</sub></b>	maximum permissible operating pressure (for units with water heating)
<b>U</b>	supply voltage
<b>I<sub>max</sub></b>	maximum current strength
<b>P<sub>motor</sub></b>	maximum input power for fans

## 1.4 Parts

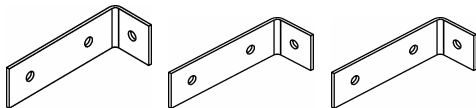
### 1.4.1 Parts supplied with the unit



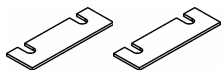
- single mounting hooks (4 per unit)



- double mounting hooks (2 per unit; **IF 4**: 4 per unit)



- wall securing hooks (3 per unit; **IF 4**: 4 per unit)



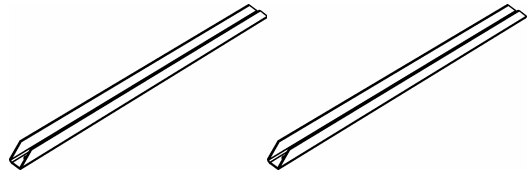
- coupling plates (2 per unit)



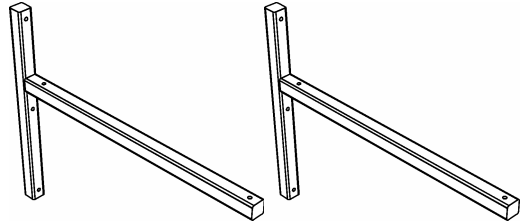
- centring pins (2 per unit)
- cable to connect units to each other
- swivel

### 1.4.2 Accessories

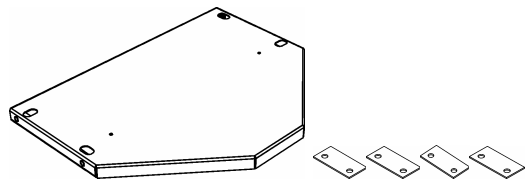
- control unit (required)



- horizontal mounting brackets (optional)



- wall mounting brackets (optional)



- base plate with 4 coupling plates (optional)
- door contact switch (optional)

### 1.4.3 Parts not supplied

The following parts required for installation should be purchased from other suppliers:

- threaded rods (M8 or 1/4")
- cable to connect unit and control unit
- isolating switch
- fuse for control unit
- room thermostat (optional)

## 1.5 Safety instructions

### 1.5.1 Operation



#### **Warning:**

**Do not insert any objects into the intake and discharge openings.**

**Never block the intake and discharge openings.**

## 1.5.2 Installation, maintenance and service



### **Warning:**

**The unit may be opened by qualified technical staff only.**



### **Before opening the unit:**

- Switch the unit off with the control unit.
- Wait until the fans have stopped.
- Allow the unit to cool down as the heat exchanger can be very hot.
- Switch the unit off at the mains.
- Close CH supply (if possible).



### **Warning:**

**The fins of the heat exchanger are sharp.**

# 2 Installation

## 2.1 Safety instructions



**Warning:**

Installation works may be performed by qualified technical staff only.

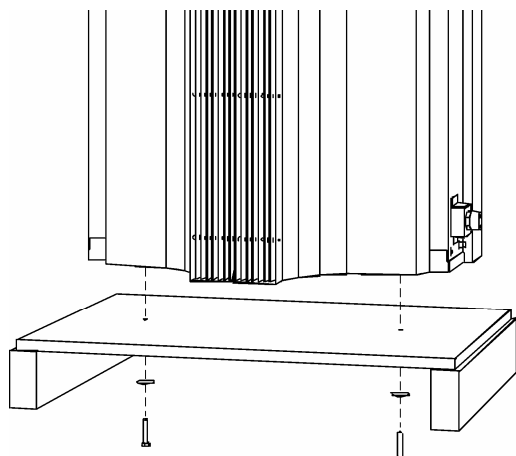
Do not perform any connection work unless you are qualified to work with 400V three-phase current.

Before opening the unit, follow the safety instructions in section 1.5.

## 2.2 Delivery check

- On delivery, check the unit and its packaging. Report any transit damage immediately to the driver and supplier.
- Make sure that all parts have been supplied (see section 1.4). Report any defects to the supplier immediately.

## 2.3 General instructions



- The unit is fixed to the pallet with bolts. Remove them first.
- Biddle recommends following the order of working described in this section for performing the installation works.

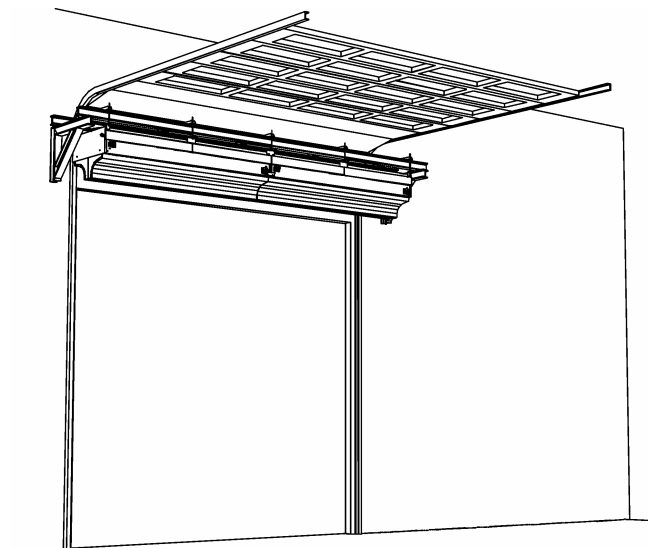


**Caution:**

- The infiltration of coarse dust, cement, etc. may damage the unit. As long as such contaminants are in the room,
  - do not put the unit into operation;
  - cover the intake and discharge openings.

The packaging, for example, can be used for this.

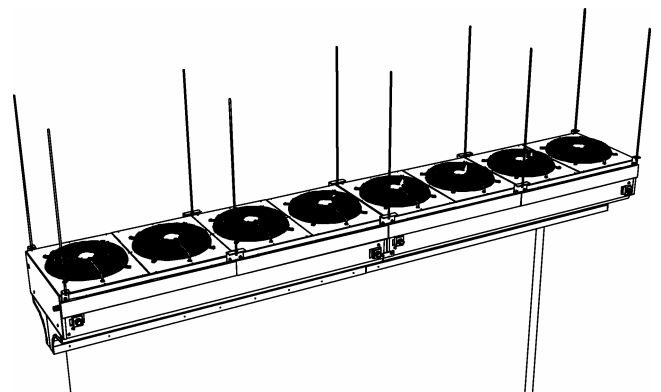
## 2.4 Suspending units horizontally



*Example of a horizontal installation*

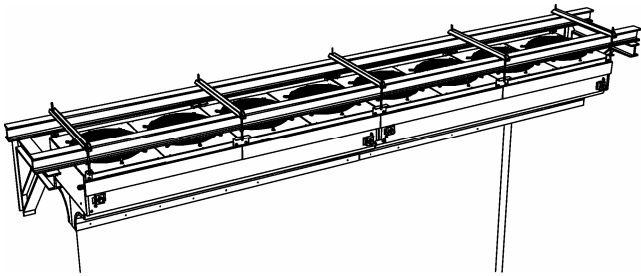
### 2.4.1 Method of suspension

There are several possibilities. In all cases, the units are suspended with threaded rods.



- You may hang the units directly from the ceiling or some other horizontal structure.



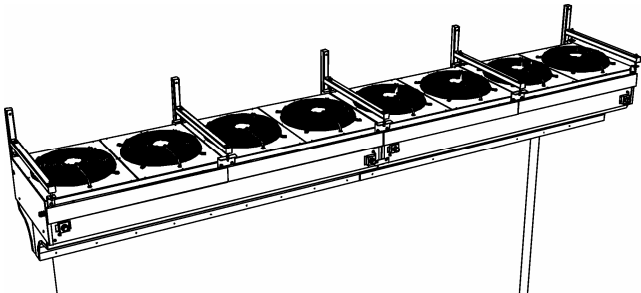


- You may apply horizontal suspension brackets (accessory) to hang the units from an auxiliary structure, consisting of two horizontal beams positioned above the door.



**Warning:**

**Make sure that the suspension brackets can never come loose from the auxiliary structure.**



- You may apply wall mounting brackets (accessory) to suspend the units from.



**Warning:**

**Make sure that the structure from which the unit is to be suspended can hold the weight of the unit.**

**2.4.2 Positioning**

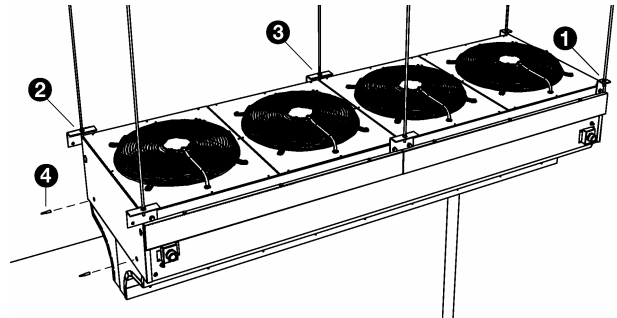
- Position the bottom face of the unit at the same height as the doorway.
- Position the discharge side of the unit as closely as possible to the doorway to ensure optimum operation.
- Centre the row of units in relation to the doorway.
- Units of different widths can be positioned in random order.



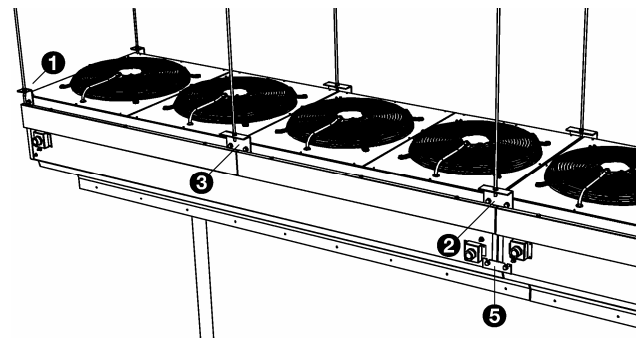
**Warning:**

**Ensure that all units can freely take in and blow out air across the entire width.**

**2.4.3 Mounting the units**



- Mount single mounting hooks **1** to suspend the units at the ends of the row.
- Mount double mounting hooks **2** to connect two adjacent units, and suspend them there.
- **For units of type IF 4:** mount double mounting hooks **3** to suspend the units at the middle.
- Insert centring pins **4** at the ends between adjacent units.



- Mount coupling plates **5** to connect two units at the bottom sides.  
Screw the coupling plates to both sides of the unit.



**Caution:**

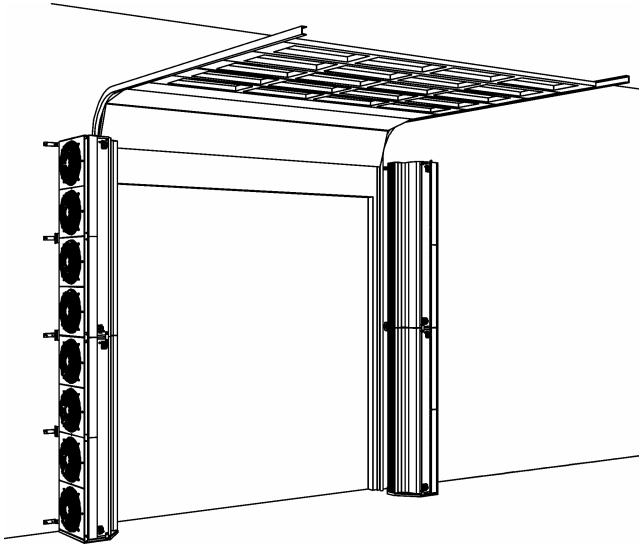
**Ensure that the units are level in both directions.**



**Warning:**

The threaded rods must be secured with locknuts, otherwise the unit may come down.

## 2.5 Installing units vertically



*Example of a vertical installation*

### 2.5.1 Method of installation

This manual assumes that the unit will be placed on a base plate (accessory). The units are stacked on one another.



**Caution:**

If no base plate is used, provide for a horizontal and completely even surface.

Whilst the units could be standing freely, it is always necessary to secure them to the wall.

### 2.5.2 Positioning

- The units may be placed either at the left side, at the right side, or at both sides of the door.
- Position the discharge side of the unit at the same width as the doorway.
- Position the discharge side of the unit as closely as possible to the doorway to ensure optimum operation.

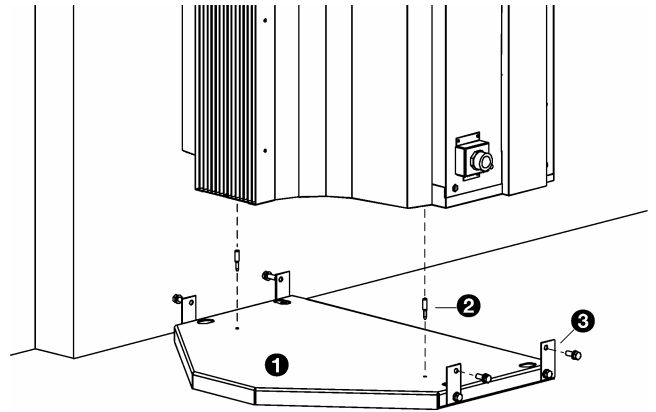
- Units of different dimensions can be stacked in random order.



**Warning:**

Ensure that all units can freely take in and blow out air across the entire height.

### 2.5.3 Installing the units



- Position and fix the base plate **1** to the floor.



**Caution:**

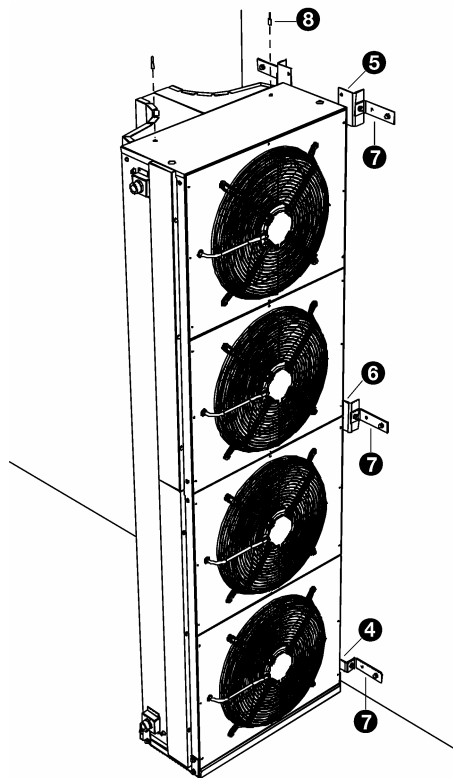
Ensure that the base plate is level.

- Insert centring pins **2** at the bottom of the first unit.
- Fasten the first unit to the base plate using coupling plates **3** (supplied with the base plate).

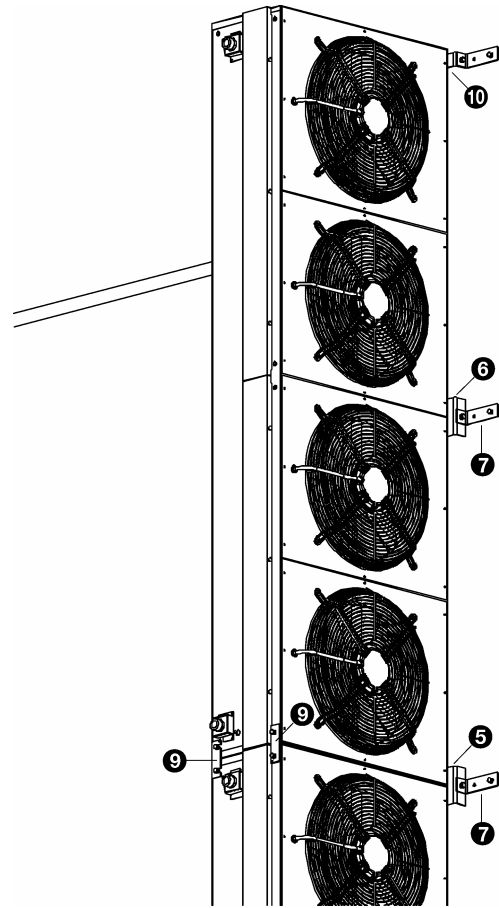


**Caution:**

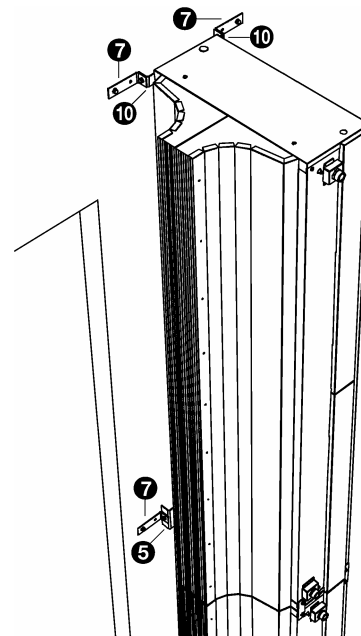
Screw the coupling plates to both sides of the unit.



- Mount a single mounting hook 4 at the bottom of the first unit.
- Mount double suspension hooks 5 to connect two stacked units to each other.
- **For units of type IF 4:** mount double mounting hooks 6 at the middle of the units.
- Mount wall securing hooks 7 to all mounting hooks. Fasten the securing hooks to a wall or other permanent structure.
- Insert centring pins 4 at the ends between stacked units.



- Mount coupling plates 9 to connect two units at the connection sides.

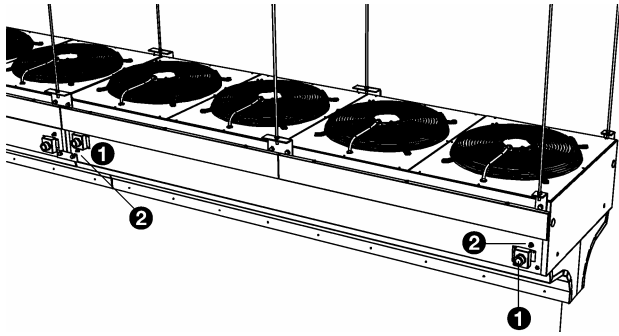


- Mount single mounting hooks 10 at the top of the topmost unit.

## 2.6 Connecting units to the CH system

Only for units with water heating (type W)

### 2.6.1 General



The connections **1** for the supply and return pipes are indicated on the units using arrows. Valves **2** for venting and draining the heat exchanger are located on connection side.



#### **Caution:**

Biddle recommends the inclusion of a valve in each pipe.

### 2.6.2 Connecting water pipes

- 1 Lay and connect the water pipes to the units.
- 2 Fill the CH system.
- 3 Vent the heat exchangers.
- 4 Check the connections for leaks.

## 2.7 Connecting the fans

### 2.7.1 General

The fans in the units are powered centrally and controlled from the control unit. The control unit is connected to the mains power supply.



#### **Caution:**

The mains power supply to the control unit must be separately fused.

In emergency and maintenance situations, it must be possible to switch off the entire installation using an isolating switch.

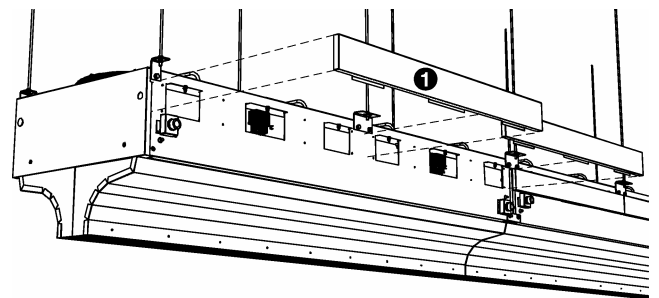
All connections must be made according to the applicable local laws, regulations and standards.



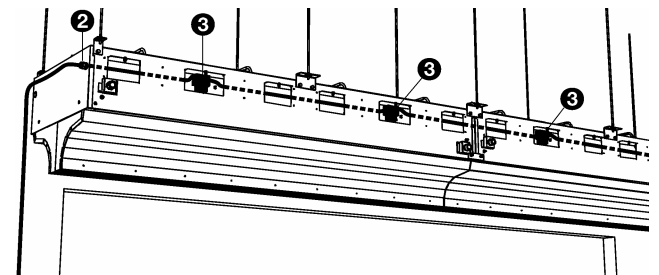
#### **Warning:**

The units must be earthed (grounded).

### 2.7.2 Making connections within the units



- Remove the covers **1** from the cable compartments.

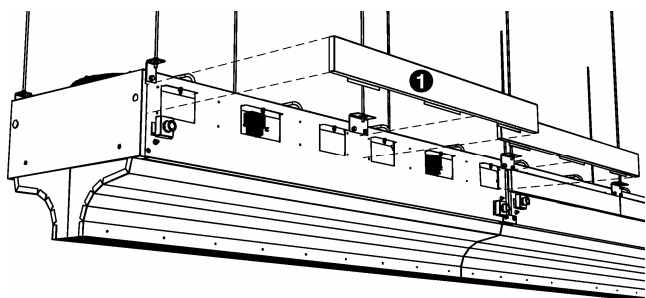


- Apply a cable gland in the feed-through **2** for pull relief purposes.  
You may lead the cable inward through either end of the row of units.
- Lay the feeder cable between the control unit and a terminal block in one unit of your choice as well as between the terminal blocks in the units.
- Connect the feeder cable to the terminal blocks **3** according to the wiring diagram.

## 2.8 Switching on and checking operation

### For all units:

- 1 Check the following connections:
  - power supply;
  - cabling between control unit and units, and between the different units;
  - external control components (if any).



- 2 Place cover ❶ back on the cable compartment.
- 3 Switch the mains supply on.
- 4 Switch the air curtain on using the control unit, and check if the air curtain blows out air.
- 5 Check the direction of rotation of the fans.

If necessary, correct the direction of rotation by interchanging the connections of two phases from the mains supply.

### For water-heated units:

- 6 Check if the heat exchanger is connected correctly.
- 7 Make sure the CH system is turned on.
- 8 Feel whether the discharged air gets warm.
- 9 Vent the heat exchanger, if necessary.

# 3 Maintenance

## 3.1 Safety instructions



### **Warning:**

**Maintenance works may be performed by qualified technical staff only.**

**Before opening the unit, follow the safety instructions in section 1.5.**

## 3.2 Cleaning

You may clean the exterior of the unit with a damp cloth and a domestic cleaner. Do not use any solvents.



### **Warning:**

**Make sure no water runs into the unit.**

Carefully remove dust from the heating element with a vacuum cleaner.

## 3.3 Scheduled maintenance

### 3.3.1 Monthly maintenance

- Check the heating elements and the fans for dust and other contaminants. Clean if necessary.
- Check if all fans are working.
- Check if the air curtain is working at all control unit settings.
- Check the discharge section for contaminations and/or blockages; clean if necessary.

#### **For units with water heating:**

- Check for water leaks. If there is a leak, disconnect the unit from the mains, and repair the leak.
- Check if the water circuit contains any entrapped air. Bleed if necessary.

### 3.3.2 Annual maintenance

- Perform all monthly checks.
- Check the cabling between the terminal blocks in the units and the control unit.
- Check the casing, the hanging or fixing construction, and the securing of each unit.
- Check if the fans are mounted correctly and are not running out of true. If necessary, fasten them again.

# 4 Solving problems

## 4.1.1 General

If the air curtain does not work, or not properly, perform the checks mentioned below.

If that does not help, there may be a defect. In that case, alert the installer.

## 4.1.2 Unit does not discharge any air

- 1 Check if the air curtain is switched on by the control unit.
- 2 Check if the unit is not disabled by an external control component (door switch or room thermostat).
- 3 Check if mains power is supplied.
- 4 Reset the thermal protector of the fans: see the documentation of the control unit.

## 4.1.3 Unit discharges little air

- 1 Remove obstacles in front of intake and discharge openings.
- 2 Check the heat exchanger for contamination. Clean it if necessary.
- 3 Check the direction of rotation of the fans.

If necessary, correct the direction of rotation by interchanging the connections of two phases from the mains supply.

## 4.1.4 Unit does not heat, or too little

- 1 When facing draught: select a higher fan speed using the operation switch.
- 2 Does the unit blow out enough air? If not, perform the checks in sections 4.1.2 and 4.1.3.

### For water-heated units:

- 3 Check the operation of the CH system.



## Declaration of Conformity

Manufacturer: Biddle BV,  
Address: Markowei 4  
9288 HA Kootsterille  
THE NETHERLANDS

We declare that the following product.

Product description: Industrial air curtain  
Brand: Biddle  
Model: IF  
Type: IF 2-W1, IF 2-W2, IF 2-W3, IF 2-A  
IF 3-W1, IF 3-W2, IF 3-W3, IF 3-A  
IF 4-W1, IF 4-W2, IF 4-W3, IF 4-A

In accordance with the following Directives:

**73/23/EEC**

**the Low Voltage Directive**

**89/336/EEC**

**the electromagnetic Compatibility Directive**

Has been designed and manufactured to the following specifications:

**EN 50081-2:1993**  
**EN 50082-2:1994**

EMC – Generic emission standard part 2. Industrial environments.  
EMC – Generic immunity standard part 2. Industrial environments.

I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications. The unit complies with all essentials requirements of the directives.

Signed by

: P. Stoelwinder, Managing Director, 1-12-2006

A handwritten signature in black ink, appearing to read 'P. Stoelwinder', with a horizontal line underneath.